IN THE CLAIMS

Please amend the claims, as follows:

1. (Currently Amended) An optical filter comprising:

a first optical element including a first reflective element for receiving light and reflecting a first wavelength band of the light centered at a first reflection wavelength, the first reflective element characterized by a first reflective filter function produced by a first grating having a first amplitude profile; and

a second optical element, optically connected to the first optical element to receive the reflected first wavelength band of the light, including a second reflective element for reflecting a second wavelength band of the light centered at a second reflection wavelength, the second reflective element characterized by a second reflective filter function produced by a second grating having a second amplitude profile that is different than the first amplitude profile ~~; whereby the shape of the first reflective filter function is different than the shape of the second reflective filter function~~, ~~and~~ the first wavelength band and the second wavelength band ~~overlap~~ overlapping spectrally,

the second optical element providing an optical filter signal having a desired effective filter function with a desired amplitude profile that is different from amplitude profiles of

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the first and second reflective filter functions, the desired effective filter function being very difficult or substantially impossible to produce by a single grating.

2. (Previously amended) The optical filter of claim 1, wherein one of the first and second optical elements is tunable to change the corresponding first or second reflection wavelength.

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3. (Previously amended) The optical filter of claim 1, wherein both of the first and second optical elements is tunable to change each of the respective first and second wavelengths.

4. (Original) The optical filter of claim 1, further comprising:

an optical directing device optically connected to the first and second optical elements; the optical directing device directing the light to the first reflective element, directing the first wavelength band reflected from the first reflective element to the second reflective element, and directing the second wavelength band reflected from the second reflective element to the output port of the optical directing device.

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5. (Original) The optical filter of claim 4, wherein the optical directing device comprises at least one circulator.

6. (Original) The optical filter of claim 5 wherein the circulator receives the light at a first port of the circulator, directs the light to the first reflective element through a second port of the circulator, receives the first wavelength band at the second port, directs the first wavelength band to the second reflective element through a third port of the circulator, receives the second wavelength band at the third port, and directs the second wavelength band to a fourth port of the circulator.

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7. (Original) The optical filter of claim 4 wherein said optical directing device comprises an optical coupler.

8. (Original) The optical filter of claim 1, wherein the first reflection wavelength and the second reflection wavelength are substantially aligned to reflect a portion of the aligned wavelength bands to an output port.

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9. (Previously amended) The optical filter of claim 1, wherein one of the first and second reflective filter functions comprises one of a Gaussian, rectangular and ramp shape.

10. (Original) The optical filter of claim 1, wherein one of the first and second reflective elements is fully apodized and the other of the first and second reflective elements is partially apodized.

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11. (Original) The optical filter of claim 1, wherein the first reflection wavelength is offset a predetermined spacing from the second reflection wavelength.

12. (Previously amended) The optical filter of claim 1, wherein at least one of the first and second optical elements have an outer cladding and an inner core disposed therein, wherein the at least one of the first and second reflective element comprises a grating disposed in a longitudinal direction of the inner core.

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13. (Original) The optical filter of claim 12, wherein the at least one of the first and second optical elements comprises:

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an optical fiber, having a reflective element written therein; and

a tube, having the optical fiber and the reflective element encased therein along a longitudinal axis of the tube, the tube being fused to at least a portion of the fiber.

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14. (Previously amended) The optical filter of claim 12, wherein the at least one of the first and second optical elements is an optical waveguide having an outer transverse dimension of at least 0.3 mm.

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15. (Original) The optical filter of claim 12, wherein the at least one of the first and second optical elements is an optical fiber.

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16. (Previously amended) The optical filter of claim 2 further includes a compression device that axially compresses at least one of the first and second optical elements, wherein at least one of the respective first and second reflective elements is disposed along an axial direction of the respective first and second optical elements.

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17. (Previously amended) The optical filter of claim 3 further comprising:

a first compressing device for compressing axially the first element to tune the first reflective element, wherein the first reflective element is written in the longitudinal direction in the first optical element; and

a second compressing device for compressing axially the second optical element to tune the second reflective element, wherein the second reflective element is written in the direction in the second

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optical element.

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18. (Original) The optical filter of claim 1 further includes a straining device for tensioning axially the first optical element to tune the first reflective element, wherein the first reflective element is disposed along an axial direction of the first optical element.

19. (Original) The optical filter of claim 1 further includes a heating element for varying the temperature of the first optical element to tune the first reflective element to reflect the selected first wavelength band.

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20. (Previously amended) The optical filter of claim 2 further includes:

a first compressing device for axially compressing at least the first optical element to tune the first reflective element, responsive to a displacement signal, wherein the first reflective element is disposed axially along the first optical element; and

a displacement sensor, responsive to the compression of the first optical element, for providing the displacement signal indicative of the change in the displacement of the first optical element.

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21. (Previously amended) The optical filter of claim 20, wherein the displacement sensor includes a capacitance sensor coupled to the first optical element for measuring the change in the capacitance that depends on the change in the displacement of the first optical element.

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22. (Currently Amended) A tunable optical filter comprising:

a tunable optical waveguide for receiving light, the tunable optical waveguide comprising:

a first inner core having a first reflective element disposed therein, the first reflective element receiving the light and reflecting a first wavelength band of the light centered at a first reflection wavelength, the first reflective element characterized by a first reflective filter function produced by a first grating having a first amplitude profile; and

a second inner core having a second reflective element disposed therein, the second inner core ~~waveguide~~ being optically connected to the first inner core ~~second waveguide~~ to receive the reflected first wavelength band of the light, the second reflective element reflecting a second wavelength band of the light centered at a second reflection wavelength, the second reflective element characterized by a second reflective filter function produced by a second grating having a second amplitude profile;

~~whereby the first wavelength band and the second wavelength band overlap spectrally~~

the first reflection wavelength and the second reflection wavelength being approximately aligned to reflect a portion of aligned wavelength bands to an output port,

the second inner core providing an optical filter signal having a desired effective filter function with a desired amplitude profile that is different from amplitude profiles of the first and second reflective filter functions, the desired effective filter function being very difficult or substantially impossible to produce by a single grating.

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23. (Previously amended) The optical filter in claim 22, wherein the first and second reflective elements include a respective Bragg grating.

24. (Previously amended) The optical filter of claim 22, wherein the tunable optical waveguide has an outer transverse dimension of at least 0.3 mm.

25. (Previously Amended) The optical filter of claim 22, further comprising:

an optical directing device optically connected to the first and second inner cores; the optical directing device directing the light to the first reflective element, directing the first

C14 end

wavelength band reflected from the first reflective element to the second reflective element.

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26. (Original) The optical filter of claim 25, wherein the optical directing device comprises at least one circulator.

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27. (Previously amended) The optical filter in claim 22, further includes a compressing device for axially compressing the tunable optical waveguide to tune the first and second reflective elements.

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28. (Original) The optical filter of claim 22, wherein the first and second reflection wavelengths are substantially aligned.

29. (Previously amended) The optical filter of claim 22, wherein the shape of the first reflective filter function is different than the shape of the second reflective filter function.

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30. (Previously amended) The optical filter of claim 70, wherein the first and second reflection wavelengths are offset by a predetermined spacing.

31. (Previously amended) The optical filter of claim 22 further includes:

a compressing device for axially compressing the tunable optical waveguide to tune the first and second reflective elements, responsive to a displacement signal, wherein the first and second reflective elements are disposed axially along the tunable optical waveguide; and

a displacement sensor, responsive to the compression of the tunable optical waveguide, for providing the displacement signal indicative of the change in the displacement of the tunable optical waveguide.

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32. (Currently Amended) A method for filtering an input light; the method comprising:

providing a first optical element including a first reflective element for receiving the input light and reflecting a first wavelength band of the light centered at a first reflection wavelength, the first reflective element characterized by a first reflective filter function produced by a first grating having a first grating amplitude profile;

providing a second optical element, optically connected to the first optical element to receive the reflected first wavelength band of the light, including a second reflective element for reflecting a second wavelength band of light centered at a second reflection wavelength, the second reflective element characterized

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by a second reflective filter function produced by a second grating having a second amplitude profile that is different than the first amplitude profile; whereby the shape of the first reflective filter function is different than the shape of the second reflective filter function; and

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tuning one of the first and second reflective elements to overlap spectrally the first wavelength band and the second wavelength band

the second optical element providing an optical filter signal having a desired effective filter function with a desired amplitude profile that is different from amplitude profiles of the first and second reflective filter functions, the desired effective filter function being very difficult or substantially impossible to produce by a single grating.

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33. (Original) The method of claim 32 wherein the tuning one of the first and second reflective elements includes compressing the one of the first and second optical elements.

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34. (Previously amended) The method of claim 32, wherein the tuning one of the first and second reflective elements comprises:

substantially aligning the first reflection wavelength and the second reflection wavelength.

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35. (Original) The method of claim 32, wherein one of the

C23 first and second reflective elements is fully apodized and the other of the first and second reflective elements is partially apodized.

C24 36. (Previously amended) The method of claim 32, wherein the tuning one of the first and second reflective elements comprises:

offsetting the first reflection wavelength and the second reflection wavelength by a predetermined spacing.

C25 37. (Currently amended) A compression-tuned optical filter comprising:

a first optical waveguide including a first reflective element for receiving light and reflecting a first wavelength band of the light centered at a first reflection wavelength, the first reflective element characterized by a first reflective filter function produced by a first grating having a first amplitude profile; and

a second optical waveguide, optically connected to the first optical waveguide to receive the reflected first wavelength band of the light, including a second reflective element for reflecting a second wavelength band of the light centered at a second reflection wavelength, the second reflective element characterized by a second reflective filter function produced by a second grating having a second amplitude profile, ~~wherein the shape of the first filter reflective function is different than the shape of the second~~

~~reflective filter function,~~ and the first wavelength band and the second wavelength band overlap spectrally,

the second optical waveguide providing an optical filter signal having a desired effective filter function with a desired amplitude profile that is different from amplitude profiles of the first and second reflective filter functions, the desired effective filter function being very difficult or substantially impossible to produce by a single grating,

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wherein the at least one of the first and second optical waveguides has outer dimensions along perpendicular axial and transverse directions, a first portion of the at least one of the first and second optical waveguides having an outer dimension being at least 0.3 mm along said transverse direction, at least a portion of the first portion having a transverse cross-section which is continuous and comprises a substantially homogeneous material; and the at least one of the first and second optical waveguides being axially strain compressed so as to change the at least one of the first and second reflection wavelengths.

Claim 38 (Cancelled).

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39. (Previously amended) The optical filter of claim 29, wherein one of the first and second reflective filter functions comprises one of a Gaussian, rectangular and ramp shape.

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40. (Previously added) The optical filter of claim 29, wherein one of the first and second reflective elements is fully apodized and the other of the first and second reflective elements is partially apodized.

Claim 41 (Cancelled).

42. (Previously amended) The optical filter of claim 29, wherein the shape of the first reflective filter function is different than the shape of the second reflective filter function.

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43. (Previously amended) The method of claim 32, further comprising tuning the other one of the first and second reflective elements to overlap spectrally the first wavelength band and the second wavelength band.

44. (Previously amended) The method of claim 32, wherein one of the first and second reflective filter functions comprises one of a Gaussian, rectangular and ramp shape.

45. (Previously amended) The method of claim 32, wherein at least one of the first and second optical elements comprises an optical waveguide having an outer cladding and an inner core disposed therein, wherein the at least one of the first and second reflective element comprises a grating disposed in a longitudinal

C28 end

direction of the inner core.

46. (Previously added) The method of claim 45, wherein the at least one of the first and second optical elements is an optical waveguide having an outer transverse dimension of at least 0.3 mm.

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47. (Previously added) The method of claim 45, wherein the at least one of the first and second optical elements is an optical fiber.

Claim 48 (Cancelled).

49. (Previously amended) The optical filter of claim 37, wherein both of the first and second optical waveguides is tunable to change each of the respective first and second reflection wavelengths.

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50. (Previously added) The optical filter of claim 37, wherein the first reflection wavelength and the second reflection wavelength are substantially aligned to reflect a portion of the aligned wavelength bands to an output port.

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51. (Previously amended) The optical filter of claim 37, wherein one of the first and second filter functions comprises one of a Gaussian, rectangular and ramp shape.

52. (Previously added) The optical filter of claim 37, wherein one of the first and second reflective elements is fully apodized and the other of the first and second reflective elements is partially apodized.

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53. (Previously added) The optical filter of claim 37, wherein the first reflection wavelength is offset a predetermined spacing from the second reflection wavelength.

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54. (Previously amended) The optical filter of claim 37, wherein at least one of the first and second reflective elements includes a Bragg grating.

Claim 55 (Cancelled).

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56. (Previously amended) The optical filter of claim 37 further includes a compression device that axially compresses at least one of the first and second optical waveguides, wherein at least one of the respective first and second reflective elements is disposed along an axial direction of the respective first and second tunable elements.

Claim 57 (Cancelled).

58. (Currently amended) An optical filter comprising:

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a first optical waveguide including a first reflective element for receiving light and reflecting a first wavelength band of the light centered at a first reflection wavelength, the first reflective element characterized by a first reflective filter function produced by a first grating having a first amplitude profile; and

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a second optical waveguide, optically connected to the first optical waveguide to receive the reflected first wavelength band of the light, including a second reflective element for reflecting a second wavelength band of the light centered at a second reflection wavelength, the second reflective element characterized by a second reflective filter function produced by a second grating having a second amplitude profile;

whereby the first reflection wavelength and the second reflection wavelength are substantially aligned

the second optical waveguide providing an optical filter signal having a desired effective filter function with a desired amplitude profile that is different from amplitude profiles of the first and second reflective filter functions, the desired effective filter function being very difficult or substantially impossible to produce by a single grating.

59. (Previously added) The optical filter of claim 58, wherein one of the first and second optical waveguides is tunable to change the corresponding first or second reflection wavelength.

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60. (Previously added) The optical filter of claim 58, wherein both of the first and second optical waveguides is tunable to change each of the respective first and second reflection wavelengths.

61. (Previously amended) The optical filter of claim 58, further comprising:

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an optical directing device optically coupled to the first and second optical waveguides; the optical directing device directing the light to the first reflective element, directing the first wavelength band reflected from the first reflective element to the second reflective element.

62. (Previously amended) The optical filter of claim 58, wherein one of the first and second reflective filter functions comprises one of a Gaussian, rectangular and ramp shape.

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63. (Previously added) The optical filter of claim 58, wherein one of the first and second reflective elements is fully apodized and the other of the first and second reflective elements is partially apodized.

64. (Previously amended) The optical filter of claim 58, wherein at least one of the first and second reflective elements includes a Bragg grating.

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65. (Previously amended) The optical filter of claim 64, wherein a portion of the at least one of the first and second optical waveguides has an outer transverse dimension of at least 0.3 mm.

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66. (Previously added) The optical filter of claim 64, wherein the at least one of the first and second optical waveguides is an optical fiber.

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67. (Previously amended) The optical filter of claim 59 further includes a compression device that axially compresses at least one of the first and second tunable optical waveguides, wherein at least one of the respective first and second reflective elements is disposed along an axial direction of the respective first and second optical waveguides.

68. (Previously amended) The optical filter of claim 58, wherein the shape of the first reflective filter function is different than the shape of the second reflective filter function.

Claim 69 (Cancelled).

70. (Previously added) The optical filter of claim 22, wherein

C43 the first wavelength band and the second wavelength band overlap spectrally.